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REMARKS

Reconsideration and allowance of the above referenced application are respectfully requested. After entry of this amendment, claims 1-20 will be pending in the case.

The drawings stand objected to due to informalities. In response, figures 1 and 2 has been amended to include the missing reference signs. The objections to claim 4 have been obviated by the amendment of the preamble of claim 4. The antecedent basis objections have also been corrected.

Claims 1 and 4 stand rejected under 35 USC 102b as allegedly being unpatentable over U.S. patent No. 5,591,966 to Harada ('966). Claims 2 and 3 stand rejected as being obvious over '966. These rejections have been obviated by the amendment of the claims herewith to recite additional structural limitations which are in no way taught or suggested by the cited prior art. Specifically, claims 1 and 4 have been amended to recite that the package is of a type that has electrical connections all the way around the edge thereof. This is supported, for example, by figure 1 which shows the electrical connections all the way around the perimeter of the package. Moreover, it is respectfully suggested this specific packaging scheme is in no way taught or suggested by '966.

'966 admittedly shows a photosensor package made of a clear material. However, the connections to this device all come from

one side of the package see figure 2A. As such, there can be relatively fewer connections to this device. Moreover, this device could not follow the packaging of one standard technique known as QFP or quad flat pack. As such, this system would be usable for far fewer connections. In fact, '966 specifically intends that the leads be located only in "defined locations". The reason for this placement is apparently to avoid interfering with the lens operation. However, by so doing, '966 limits the number of connections that can be made, and hence inherently limits the size of the image sensor that can be used with the packaging scheme.

For these reasons, it is respectfully suggested that claims 1 and 4, each of which now define the electrical connections being along all edges of the edge perimeter, are not in any way taught or suggested by the cited prior art.

Claims 2 and 3 stand rejected as being obvious. However, it is respectfully suggested that the '966 reference does not teach or suggest this structure. Nowhere does '966 teach anything about using a CMOS image sensor. Moreover, nowhere does the prior art teach or suggest forming a plastic package out of acrylic. The contention that resin and acrylic are equivalent in the art is respectfully traversed. Resin is often used for different applications than acrylic. Therefore, it is

respectfully suggested that the mere statement in the office action does not meet the patent office's burden of showing that resin and acrylic are "recognized equivalents".

The new claims which are added herewith are respectfully suggested to be completely patentable over the cited prior art. Each of these claims should also be allowable, therefore, over the prior art. Claim 5 defines the quad flat pack, which as described above, is in no way suggested by the cited prior art. Claim 6 adds the recitation of a second photosensitive element within the single clear package. This is in no way taught or suggested by the cited prior art and has the advantage of enabling image sensing from a number of different directions. Many of the other claims include similar limitations. Claim 12 also defines first and second image sensors in the same clear package, as does claim 17. Claim 18 defines that the two image sensors obtain image information from opposite sides of a reference line. Claims 19-20 similarly defines obtaining image information from two opposite directions.


In view of the above amendments and remarks, therefore, all of the claims should be in condition for allowance. A formal notice to that effect is respectfully solicited.

Applicant asks that all claims be allowed. Enclosed is a \$168.00 check for excess claim fees. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: \_\_\_\_\_

12/13/01

  
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Attached is a marked-up version of the changes being made by the current amendment.

Attachment: Proposed drawing change.

Version with markings to show changes made

Please amend the claims as follows:

1. (Amended) A packaged photosensitive element, comprising:
  - a photosensitive element, having electrical connections; and
  - a clear plastic package, having said photosensitive element mounted therein, and providing a edge perimeter having electrical connections along all edges of said edge perimeter, which connections are connected to said electrical connections on said photosensitive element, said clear plastic package being clear at all locations within said perimeter.
2. An element as in claim 1, wherein said photosensitive element is a CMOS active pixel sensor.
3. An element as in claim 1, wherein said plastic package is acrylic.
4. (Amended) A method [of packaging an image sensor], comprising:  
obtaining an image sensor with electrical connections;

forming a clear plastic package for said image sensor, with said image sensor totally encased within said clear plastic package;

forming connections on all edges of a perimeter of said image sensor;

connecting said electrical connections of said image sensor to said connection; [corresponding] [connections on a perimeter of said image sensor;] and

operating said image sensor to receive light that passes through said clear plastic package.

Please add the following new claims.

5. An element as in claim 1, wherein said clear plastic package is in the shape of a quad flat pack.

6. An element as in claim 1, further comprising a second photosensitive element, receiving incoming light from a different direction than said photosensitive element.

7. An element as in claim 1, wherein said photosensitive element accumulates charge using a photogate.

8. A method as in claim 4, wherein said operating

comprises accepting light from any of a plurality of different incoming angles.

9. A method as in claim 8, wherein said clear plastic package is formed of acrylic.

10. A method as in claim 4, wherein said clear plastic package is formed into the shape of a quad flat pack.

11. A method as in claim 4, wherein said obtaining an image sensor comprises obtaining first and second image sensors, and using said first image sensor to acquire light in a first direction through said clear plastic package and using said second image sensor to acquire light in a second direction through said clear plastic package.

12. An image sensor, comprising:

first and second image sensors; and

a clear plastic package for said first and second image sensors, said clear plastic package packaging said first and second image sensors with said first image sensor acquiring light from a first side of said clear plastic package, and said second image sensor acquiring light from a second, opposite side



of said clear plastic package.

13. A sensor as in claim 12, wherein said clear plastic package has a perimeter surrounding said first and second image sensors, and an edge of said perimeter including electrical connections to said first and second image sensors.

14. A sensor as in claim 12, further comprising a mounting part, mounting said package such that said edge is coupled to an object of mounting.

15. An image sensor as in claim 12, wherein said first and second image sensors are CMOS image sensors.

16. An image sensor as in claim 12, wherein said first and second image sensors acquire said image using photogates.

17. A method of acquiring an image, comprising:  
packaging first and second image sensors in a single clear package; and

acquiring an image with said first image sensor from a first side of said package, and acquiring an image from said second image sensor from a second, opposite side of said

package.

18. A method as in claim 17, wherein said first side of said package is on the left of a reference line on an object of mounting, and said second side of said package is on the right side of a reference line on said object of mounting.

19. An image sensor, comprising:

a clear package, having a rectangular outer perimeter with image acquiring surfaces defined within said rectangular outer perimeter; and

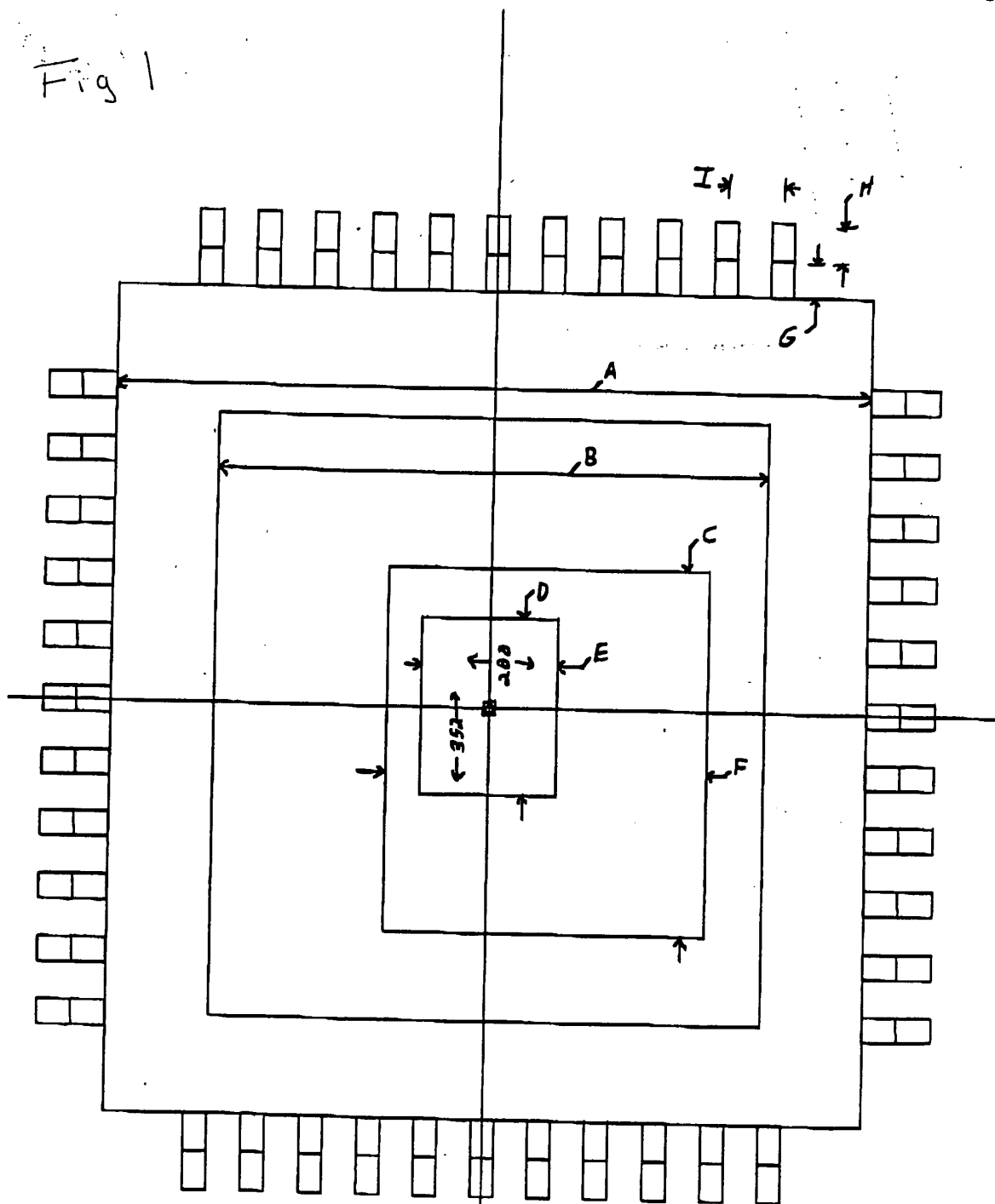
an image sensor, obtaining image information from a first image acquiring surface and from a second opposite image acquiring surface.

20. An image sensor as in claim 19, wherein said image sensor includes first and second image sensors facing in opposite directions.

# PB-100 in QFP (44)

10-12-98  
9007

Fig 1



A = 550 mils  
B = 410 mils  
C = 289 mils  
D = 112 mils  
E = 92 mils

F = 224  
G = 5030 mils  
H = 15 mils  
I = 39 mils

# = ARRAY CENTER  
⊕ = PKG. CENTER

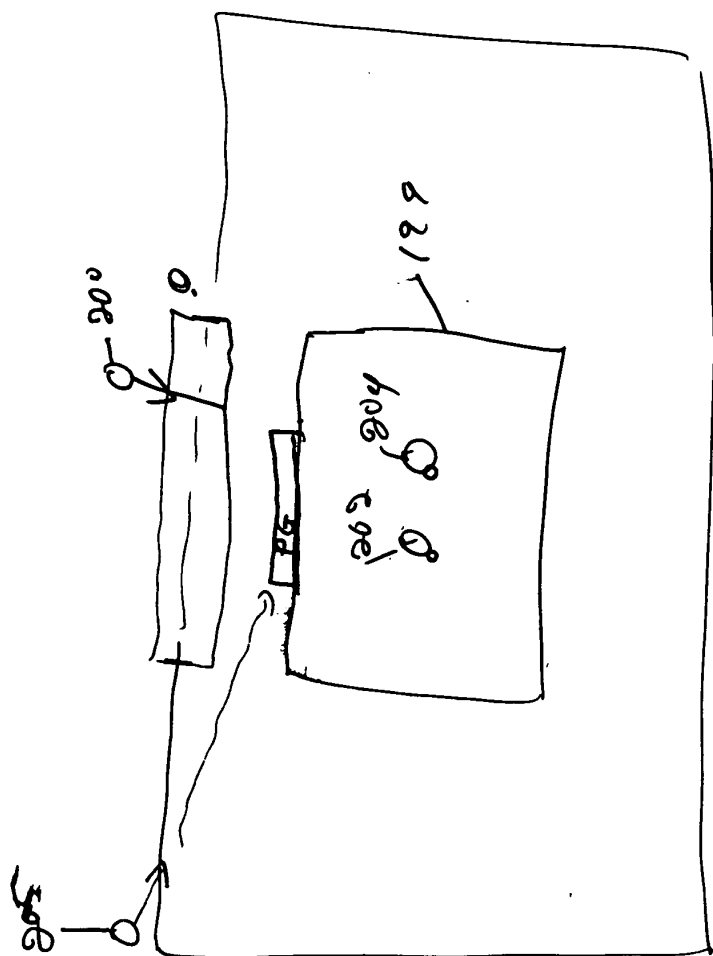


Fig 2